

Notice of Allowability

Application No.

10/623,448

Examiner

Kianni C. Kaveh

Applicant(s)

KITTAKA ET AL.

Art Unit

2833

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 2/17/05.
2. ☒ The allowed claim(s) is/are 2-22.
3. ☒ The drawings filed on 18 July 2003 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|---|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____ |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____ |

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- Applicant's canceling of claims 1 and 23 in the amendment/response submitted on 2/17/05 is acknowledged.

Reason for Allowance

Claims 2-22 are allowed for the following reasons:

The instant application is deemed to be directed to a nonobvious improvement over the invention patented in Pat. No. Lin et al. (US 2001/0012149).

Claim 2 is allowed because the prior art of record, taken alone or in combination, fails to disclose or render obvious $2 \leq |(\Delta\lambda/\lambda_0) / (\Delta\omega / \omega_0)|$ in combination with the rest of the limitations of the base claim.

Claim 3 is allowed because the prior art of record, taken alone or in combination, fails to disclose or render obvious wherein the photonic crystal includes a periodic direction and said at least either one of the input medium and the output medium comprising the photonic crystal, includes end surfaces perpendicular to the periodic direction of the photonic crystal as an input surface and an output surface, the photonic crystal includes a photonic band gap and a photonic band in the vicinity of the photonic band gap, and the electromagnetic waves entering the input surface are propagated by the photonic band in combination with the rest of the limitations of the base claim.

Claims 4-8 are allowed because the prior art of record, taken alone or in combination, fails to disclose or render obvious wherein the photonic crystal includes end surfaces from which the periodic characteristic is exposed as an input surface and an output surface, a photonic band structure having a line, which is either a Brillouin

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zone boundary line or a central line, and a photonic band, and light waves entering the input surface are propagated by one of the photonic band, which exists on the Brillouin zone boundary line of the photonic band structure or in the vicinity of the Brillouin zone boundary line; and the photonic band, which exists on the central line of the photonic band structure or in the vicinity of the central line in combination with the rest of the limitations of the base claim.

Claims 9-16 are allowed because the prior art of record, taken alone or in combination, fails to disclose or render obvious wherein the photonic crystal has an end surface, which includes a reflective diffraction grating that comprises said diffraction grating, and when electromagnetic waves including plural frequency components are input to the photonic crystal, the reflective diffraction grating produces diffracted wave for each of the plural frequency components of the electromagnetic wave in different directions in combination with the rest of the limitations of the base claim.

Claims 17-22 are allowed because the prior art of record, taken alone or in combination, fails to disclose or render obvious an array waveguide diffraction grating including an input slab waveguide connected to the input waveguide, an output slab waveguide connected to output waveguide, and an arrayed waveguide connected between the two slab waveguides and generating an optical path length difference, with the arrayed waveguide comprised of the photonic crystal as the diffraction grating that periodically divides electromagnetic waves and produces a phase difference in the wave fronts of the divided electromagnetic waves in combination with the rest of the limitations of the base claim.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to K. Cyrus Kianni whose telephone number is (571) 272-2417.

The examiner can normally be reached on Monday through Friday from 8:30 a.m. to 6:00 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font, can be reached at (571) 272-2415.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

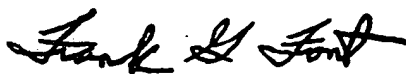
or faxed to:

(703) 872-9306 (for formal communications intended for entry)

or:

Hand delivered responses should be brought to Crystal Plaza 4, 2021 South Clark Place, Arlington, VA., Fourth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-0956.



K. Cyrus Kianni
Patent Examiner
Group Art Unit 2883

Frank Font
SPE AU 2883

April 19, 2005